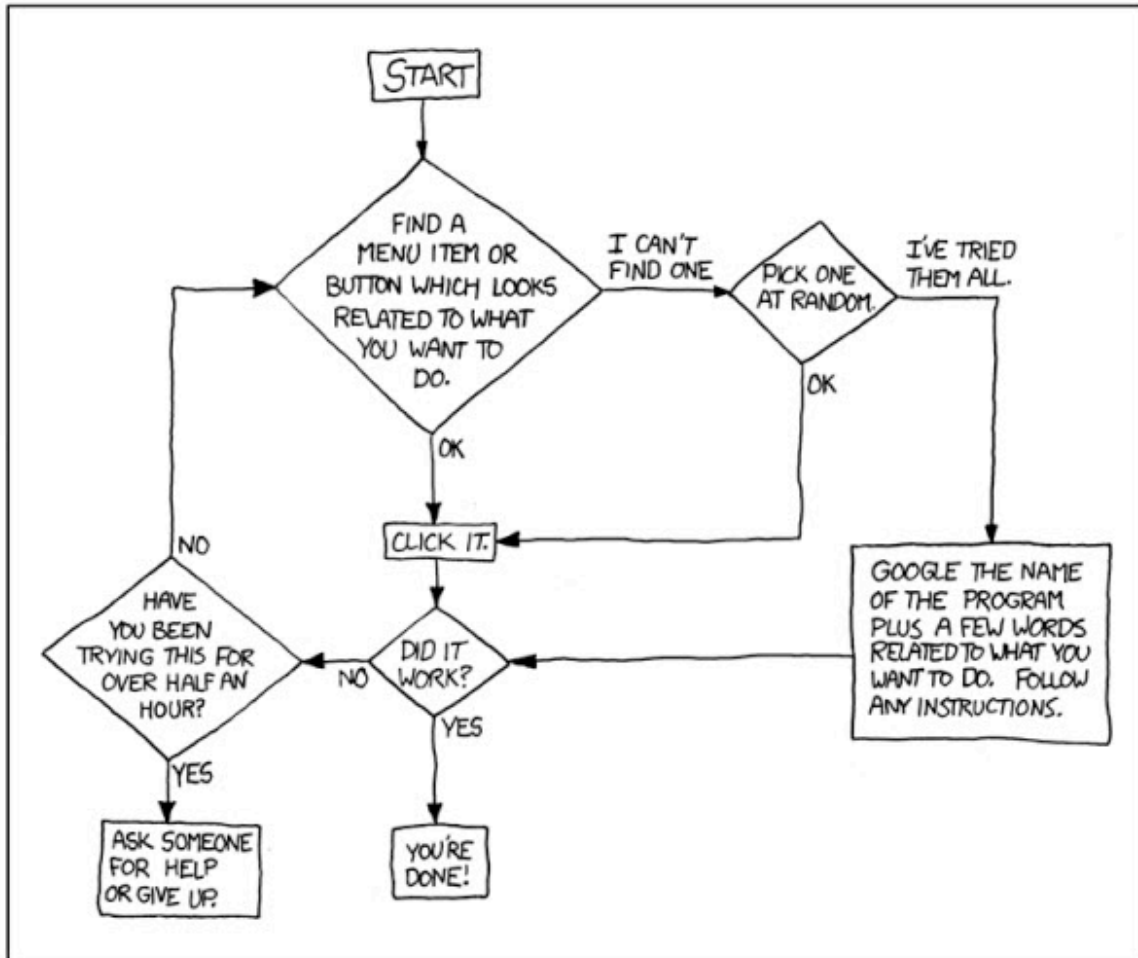# GCSE Computing Algorithm Questions

DEAR VARIOUS PARENTS, GRANDPARENTS, CO-WORKERS, AND OTHER "NOT COMPUTER PEOPLE."

WE DON'T MAGICALLY KNOW HOW TO DO EVERYTHING IN EVERY PROGRAM. WHEN WE HELP YOU, WE'RE USUALLY JUST DOING THIS:

PLEASE PRINT THIS FLOWCHART OUT AND TAPE IT NEAR YOUR SCREEN. CONGRATULATIONS; YOU'RE NOW THE LOCAL COMPUTER EXPERT!

Programming / Algorithm Revision Tasks

For each of the following tasks you can EITHER write out a pseudocode algorithm OR try to write some Python code and then write it out here.

In the exam you won't have access to a programming environment, so don't JUST rely on trying and retrying bits of code.

Task 1:
Write a program that asks the user for two numbers.
If the first number is bigger than the second number, then swap the two numbers round.
If the first number isn't bigger than the second number, then don't do anything.

Task 9:

The cost of a day-time journey is £3 for the first kilometre and £2 for every kilometre after that.

If there are five or more passengers in the taxi, an extra 50% is added to the charge.

Write an algorithm to calculate the cost of a day-time journey.

Your algorithm should:

- allow the number of passengers and the distance of the journey to be input as whole
  numbers,
- calculate the cost of the journey,
- output the cost that has been calculated.

Task 2:
You need to program a display board that will flash a message up a set number of times.
Write a program that asks the user to input the number of flashes.
If the number entered is bigger than 20, the program should print an error message and
quit. Otherwise the program should display "********WELCOME********" followed by a blank
line for each flash (so if the user wants 3 flashes the program should print:
WELCOME/blank line/WELCOME/blank line/WELCOME/blank line.

Task 3:
Zak is writing a program that uses an array called WordList. This array contains 10 foreign words in alphabetical order. The contents of the array are shown below.

WordList (1)	akesi
WordList(2)	esun
WordList(3)	jaki
WordList(4)	kala
WordList(5)	lipu
WordList(6)	mama
WordList(7)	nasa
WordList(8)	olin
WordList(9)	taso
WordList(10)	walo

Zak needs to write a routine that:
- allows the user to input a word,
- goes through the items in the array WordList in turn, starting from WordList(1),
- if it finds the word that the user has input, it outputs "Word found".

Task 8:

The wages earned by a worker is either £2 for every teddy bear they have made or £5 for every hour they have worked, whichever is larger.

Write an algorithm that:

- allows the user to input the number of teddy bears made and the number of hours worked
- calculates the wages for the number of teddy bears made
- calculates the wages for the number of hours worked
- outputs the larger of the two results.

Task 7:

The routine for rolling the dice is written as a sequence below.

BEGIN RollTheDice
DiceResult(1) = Random Number between 1 and 6
DiceResult(2) = Random Number between 1 and 6
DiceResult(3) = Random Number between 1 and 6
END

Rewrite this routine so that it uses iteration. You may use a diagram.

Task 4:

Zak is trying to write a program that will calculate the circumference of a wheel.

The program should:

- declare a variable called Pi and set its value to 3.14
- ask the user for the size of the wheel
- calculate the circumference
- output the circumference

Task 5:
A dog that is 5 years old is equivalent to a 42 year old human. Ashok is writing a program which converts the age of a dog to the equivalent age for a human.

The program uses the following method:
• The user inputs age of the dog in years
• If the age is 2 or less, the human equivalent is 12 times the age
• If the age is more than 2, the human equivalent is 24 for the first 2 years, plus 6 for every additional year.

Write an algorithm to calculate and output the human equivalent of the age of a dog using the method described.

Task 6:
Angelina is writing some software for a vending machine. In the program there is an array, called Coins, that stores the value of the last 10 coins placed into the machine.

Here is an example of the contents of the array Coins during a sale.

10	100	20	50	5	0	0	0	0	0

In the example above, the value of Coins(1) is 10.

1. Write a program that will reset the value of each element in the array to 0.

2. Write a program that will calculate the total value of the coins that are stored in the array.